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Date of Signature and Deposit: 6/28/04

Jean C. Baker  
Jean C. Baker, Reg. No. 35,433

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Janis T. Eells; Harry T. Whelan; Margaret T. T. Wong-Riley  
For: Red to Near-Infrared Photobiomodulation Treatment of the Visual System  
in Visual System Disease or Injury  
Serial No.: 10/758,793 Filed: January 16, 2004  
Group Art Unit: 3739 Examiner: Henry M. Johnson, III  
Docket No.: 650053.91690

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Commissioner For Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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**DECLARATION OF HARRY T. WHELAN**

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Dear Sir:

1. I, Harry T. Whelan, M.D., am both an inventor of the above-identified application and an author of Whelan et al., "Protection Against Methanol-induced Retinal Toxicity by LED Photostimulation," Ophthalmic Technologies XII 461 1-239-246, 2002, cited by the Examiner in the first office action of the above identified application.

2. The other two authors of Whelan et al., Margaret T. T. Wong-Riley and Janie T. Eells, are also named inventors of the above-identified application. (See enclosed Exhibit A)

3. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the above-identified application or any patent issuing thereon.

Dated: 6/15/06

Respectfully submitted,

Harry T. Whelan, M.D.  
Harry T. Whelan, M.D.



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  - Signal & Image Processing

Abstract

PUBLICATIONS

Protection against methanol-induced retinal toxicity by LED photostimulation

Harry T. Whelan M.D.,  
Margaret T. Wong-Riley,  
Janis T. Eells

Publication:
Proc. SPIE  
Vol. 4611,  
p. 239-246,  
Ophthalmic  
Technologies  
XII; Fabrice  
Manns, Per  
G.  
Soederberg,  
Arthur Ho;  
Eds.

Publication Date:
Jun 2002

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Abstract

We have initiated experiments designed to test the hypothesis that 670-nm Light-Emitting Diode (LED) exposure will attenuate formate-induced retinal dysfunction in a rodent model of methanol toxicity. Methanol intoxication produces toxic injury to the retina. The toxic metabolite formed in methanol intoxication is formic acid, a mitochondrial toxin known to inhibit cytochrome oxidase activity. 670-nm LED light has been hypothesized to act by stimulating cytochrome oxidase activity. To test this hypothesis, one group of animals was intoxicated with

methanol, a second group was intoxicated with methanol and LED-treated and a third group was untreated. LED treatment (670 nm for 1 min 45 seconds equals 50 mW/cm<sup>2</sup>, 4 joules/cm<sup>2</sup>) was administered at 5, 25, and 50 hours after the initial dose of methanol. At 72 hours of methanol intoxication, retinal function was assessed by measurement of ERG responses and retinas were prepared for histologic analysis. ERG responses recorded in methanol-intoxicated animals revealed profound attenuation of both rod-dominated and UV-cone mediated responses. In contrast, methanol-intoxicated animals exposed to LED treatment exhibited a nearly complete recovery of rod-dominated ERG responses and a slight improvement of UV-cone mediated ERG responses. LED treatment also protected the retina against the histopathologic changes produced by formate in methanol intoxication. These data provide evidence that LED phototherapy protects the retina against the cytotoxic actions of formate and are consistent with the hypothesis that LED photostimulation improves mitochondrial respiratory chain function.

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